REMARKS

This amendment is responsive to the first Office Action dated November 12, 2003. Applicants respectfully request reconsideration and allowance of claims 1-3, 5-13, 15, and 20-25 as set forth herein.

The current status of the claims

All claims 1-19 stand rejected under 35 U.S.C. § 103(a) as unpatentable over various combinations of references.

Claims 1-4 and 9 stand rejected as unpatentable over Dair et al. (U.S. 2002/0033979, hereinafter "Dair") in view of Natori (U.S. 6,443,597, hereinafter "Natori").

Claims 5-7 stand rejected as unpatentable over Dair in view of Roberts et al. (U.S. 2002/0149312, hereinafter "Roberts").

Claims 10 and 11 stand rejected as unpatentable over Dair in view of Adachi et al. (U.S. 4,369,435, hereinafter "Adachi").

Claim 8 stands rejected as unpatentable over Dair and Roberts in further view of Nakanishi et al. (U.S. 5,539,767).

Claims 12-14 stand rejected as unpatentable over Dair.

Claim 15 stands rejected as unpatentable over Dair in view of Natori.

Claims 16 and 19 stand rejected as unpatentable over Stekelenburg (U.S. 2003/0185020, hereinafter "Stekelenburg" in view of Stillwell et al. (U.S. 6,361,357, hereinafter "Stillwell").

Claim 17 stands rejected as unpatentable over Stekelenburg and Stillwell in further view of Frank et al. (U.S. 6,411,522).

Claim 18 stands rejected as unpatentable over Stekelenburg and Stillwell in further view of Tamura et al. (U.S. 4,393,677).

Regarding claims 5-8, 10, and 11, the Office Action does not indicate Natori is included in the proposed combinations of references. As these claims depend from claim 1, Applicants assume herein that the proposed combination of references used in rejecting each of these claims includes Natori.

Claims 1-3, 5, 6, 9, and 11-15 patentably distinguish over the cited references

Claim 1 calls for a mounting structure for assembling a plurality of optoelectronic components, comprising first and second substrates on each of which at least one optoelectronic component is arranged, the substrates being in the shape of a rhombus and each having an edge connector disposed on an edge thereof providing electrical access to the at least one first optoelectronic component. Claim 1 further calls for the edge connector of the second substrate to connect with the edge connector of the first substrate to electrically interconnect the optoelectronic components.

Dair relates to optical transceiver modules. Dair FIGURE 1 shows a transmitter printed circuit board 106 supporting an optical transmitter 110, and a receiver printed circuit board 108 supporting an optical receiver 111. See ¶[0078]. The Office Action also cites Dair ¶[0192] which, referring to FIGURE 22A, discusses edge connectors 2230 of the printed circuit boards.

However, these edge connectors do not electrically interconnect optical transmitters 110. Rather, the edge connectors allow each board, such as the transmitter board 106 or the receiver board 108, to electrically connect with the miniature back plate 2212, which in turn includes electrical connector 2218 for connecting to a host system printed circuit board. Each transmitter or receiver board 106, 108 connects with the host system printed circuit board via the back plate 2212. The optical transmitters are not electrically interconnected, as called for in claim 1. Rather, "[t]he miniature back plane 2212 includes traces or busses to couple between the edge connectors 2214 and the pins or electrical connector 2218." Dair ¶[0193].

The Office Action acknowledges that Dair does not disclose substrates in the shape of a rhombus, and instead relies upon Natori for this element of claim 1. However, Natori also does not show a substrate in the shape of a rhombus. Rather, Natori shows

a reflector 7 that is in the shape of a rhombus. The substrate 2, which supports many reflectors 7, has a sawtooth shape. See Natori col. 5 lines 36-41 and FIGURES 1, 3, 4, and 5.

Claim 2 further calls for each of the first substrate and the second substrate to have a rhombus shape that corresponds to a primitive unit cell of a hexagon. As discussed in the present application at least at ¶[0047], a rhombic primitive unit cell of a hexagon has angles of 60° and 120°. Applicants find mention only of square-shaped rhombuses in Natori, and these square-shaped rhombuses are reflectors, not substrates. As discussed in the application at least with reference to FIGURE 1, substrates having the shape called for in claim 2 can form densely-packed two-dimensional arrays, and can also be used to create three-dimensional structures such as spheres or geodesic-type domes. See specification ¶[0047].

Claim 3 calls for an interconnecting element interposed between the edge connectors of the first and second substrates that connects with the edge connector of the first substrate and that connects with the edge connector of the second substrate to connect the edge connector of the first substrate with the edge connector of the second element. Dair shows a plurality of transmitter boards having edge connectors mating with the back plate 2212. However, back plate 2212 is not interposed between the edge connectors. Moreover, the back plate 2212 does not connect the edge connectors together. Rather, the back plate 2212 connects each transmitter board separately to a common host system printed circuit board. See Dair ¶¶[0192], [0193].

The Office Action refers to Dair ¶[0196] in rejecting claim 3; however, that paragraph merely describes details of the mating of edge connectors 2214 with the back plate 2212. There is no disclosure or fair suggestion that the back plate provide interconnection between the boards. Rather, the back plate 2212 serves as a common bus for connecting all the transmitter and receiver boards with the host system printed circuit board.

Claim 9 calls for a third rhombus-shaped substrate having first and second edge connectors electrically interconnecting with a second edge connector of each of the first and second substrates, in which the first, second, and third rhombus-shaped substrates are arranged to form a hexagonally shaped mounting structure. Neither Dair nor Natori disclose three substrates forming a hexagonally shaped mounting structure. Moreover, neither Dair nor Natori disclose an arrangement of three substrates in which each substrate is electrically interconnected with both of the other two substrates by edge connectors.

Claim 10 calls for a terminating element connecting with a second edge connector of one of the first and second substrates, the terminating element including circuitry that completes an electrical circuit including the at least one first and second optoelectronic components. **Claim 11** calls for a terminating element connecting with a second edge connector of one of the first and second substrates to supply electrical power to the mounting structure including the at least one first and second optoelectronic components.

The Office Action cites Adachi col. 1 lines 39-40 against claims 10 and 11, which reads: "In this system, a small current for monitoring flows constantly or periodically through the line via a terminating element." In the context of Adachi, which relates to fire detector monitoring, this appears to describe a high impedance current shunt for monitoring electrical power to a fire detector. Such a current shunt is unrelated to the terminating elements called for in claims 10 and 11, which connect with a edge connector of one of the substrates to provide electrical termination or electrical power. Moreover, as pertaining to claim 11, the terminating element of Adachi does not supply electrical power.

New claim 20 calls for the first and second substrates to be generally planar and to lie in a common plane when electrically interconnected by the edge connectors. This claim is supported at least by FIGURE 1 and ¶[0069] of the present application. The

transmitter boards 106 of Dair are parallel, but they are not coplanar, i.e., they do not lie in the same plane.

For at least the above reasons, Applicants submit that claims 1-3, 5-11, and 20 as set forth herein patentably distinguish over the applied references, and respectfully ask for allowance of claims 1-3, 5-11, and 20.

Claims 12, 13, 15, and 21 patentably distinguish over the cited references

Claim 12 calls for a modular mounting assembly for connecting a plurality of light emitting diodes (LED's), comprising a plurality of substrates. Each substrate has at least one LED fixedly arranged thereon, and a plurality of connectors arranged thereon that are in electrical communication with the at least one LED. The plurality of substrates are arranged in a spatial arrangement having selected connectors of adjacent substrates connected together to electrically interconnect the plurality of LED's as an electrical circuit.

Dair does not disclose an arrangement of substrates having selected connectors of adjacent substrates connected together to electrically interconnect the plurality of LED's as an electrical circuit. The Office Action identifies the transmitter boards 106 of Dair as corresponding to the substrates of claim 12. However, the transmitter boards 106 do not have connectors that electrically interconnect the plurality of optical transmitters 110 as an electrical circuit. Rather, each transmitter board 106 has only a single connector, and that connector does not connect with an adjacent transmitter board. Instead, each transmitter board 106 connects with the back plate 2212.

Claim 13 calls for a plurality of interconnecting elements interposed between selected adjacent substrates that electrically and structurally interconnect the selected adjacent substrates. The Office Action identifies the interconnecting element as the back plate 2412. However, this back plate is not interposed between adjacent substrates, and does not electrically

interconnect the selected adjacent substrates. Rather, the back plate acts as a bus connecting all the transmitter substrates 106 with a common host system printed circuit board. See Dair ¶[0193]

Claim 15 calls for the plurality of substrates to each have a non-rectangular rhombic shape. The transmitter substrates 106 of Dair appear to be rectangular. See FIGURE 2. Nor is this selection arbitrary. The boards of Dair must fit into the box-shaped housing 119. A rectangular board fits into the box, whereas a non-rectangular rhombic board would not fit well into the box. Once skilled in the art would not be motivated by Dair to employ a non-rectangular rhombic substrate.

New claim 21 calls for the spatial arrangement of the plurality of substrates to define a two-dimensional array. The substrates of Dair are not arranged in a two-dimensional array.

New claims 22-25 patentably distinguish over the cited references

New claim 22 calls for a light emitting structure comprising a plurality of multi-sided substrates arranged with at least one side of each substrate adjacent a side of a neighboring substrate. Claim 22 further calls for electrical connectors of the adjacent sides to electrically connect the neighboring substrates together. Claim 22 still further calls for a plurality of light emitting elements disposed on the plurality of multi-sided substrates, the light emitting elements being electrically interconnected via the electrical connectors

The cited references do not show the features of claim 22. For instance, the transmitter boards 106 of Dair are not arranged with at least one side of each board adjacent a side of a neighboring board. Rather, the transmitter boards 106 of Dair are arranged parallel to one another with no neighboring sides. The edge connectors of Dair do not electrically connect neighboring substrates together; rather, the edge connectors connect with a common host system printed circuit board.

Natori also does not disclose or fairly suggest connectors for connecting neighboring substrates. Applicants note that the square or rhomboidal boxes shown in Natori illustrate reflectors 7, and not substrates. While FIGURE 5 of Natori does show a plurality of neighboring multi-sided (jagged edged) substrates (each supporting an LED plane display unit 1) separated by gaps g, there is no suggestion in Natori for electrical connectors of the adjacent sides to electrically connect the neighboring substrates together, or for light emitting elements to be electrically interconnected via such electrical connectors.

New claim 23 calls for each connector to include a plurality of electrical conductor members. Claim 23 further calls for a plurality of interconnecting elements, each interconnecting element being disposed between two neighboring multi-sided substrates and electrically connecting with the connectors of the two adjacent sides. Each interconnecting element electrically connects the electrical conductor members of the connectors of the two adjacent sides together in a pre-selected electrical configuration. This claim is supported in the original specification at least by ¶¶[0053]-[0055], where for example in FIGURE 7 the interconnecting elements are elements 50A, 50D and the electrical conductor members are labeled 1, 2, 3, 4, 5 for each connector of each substrate 12.

The back plate 2212 of Dair cannot correspond to the interconnecting elements of claim 23 at least because there is only one back plate, the back plate is not disposed between neighboring substrates, and the back plate does not electrically connect electrical conductor members of the connectors of the transmitter boards 106 together.

New claim 24 depends from claim 23, and further calls for the light emitting structure to be configurable into any of a plurality of physical and electrical configurations by selectively arranging the multi-sided substrates and by selecting interconnecting elements with pre-selected electrical configurations that effectuate the selected electrical

configuration of the light emitting structure. Such a physically and electrically modular and configurable design is not disclosed in the cited references.

For example, while it may be possible to arrange the transmitter boards 106 and receiver boards 108 of Dair into a plurality of different physical arrangements, the edge connecters always connect to the bus of the back plate 2212, so that the same electrical configuration is obtained. The jagged edge boards of Natori may be arranged into various physical arrangements, but the boards are not electrically interconnected by interconnecting elements with pre-selected electrical configurations.

New claim 25 calls for each connector to include a plurality of electrical conductor members, and for the light emitting structure to further include a plurality of interconnecting elements interposed between the neighboring multi-sided substrates. Each interposed interconnecting element mechanically fastens the neighboring substrates together and has two ports that electrically connect with the two connectors of the two adjacent sides. Each interconnecting element electrically connects the electrical conductor members of the connectors of the two adjacent sides together in a pre-selected electrical configuration. This claim is supported in the original specification at least by ¶¶[0053]-[0055].

The cited references do not show these features. The back plate 2212 of Dair, for example, is not interposed between neighboring multi-sided substrates. The back plate 2212 also does not mechanically fasten neighboring substrates together. Rather, the transmitter boards 106 are each separately fastened into a corresponding slot 240 of the base 205 of the housing 119. See Dair ¶[0086] and Dair FIGURE 2.

CONCLUSION

In view of the foregoing amendments and remarks, it is respectfully submitted that claims 1-3, 5-13, 15, and 20-25 are now in condition for allowance. Applicants ask for allowance of claims 1-3, 5-13, 15, and 20-25 as set forth herein.

Respectfully submitted,

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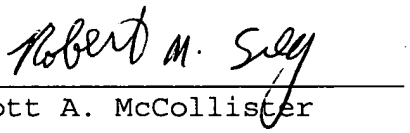

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